



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,737	08/13/2001	Son Ky Quan	SC09785T CD1	7252
23125	7590	04/20/2004	EXAMINER	
FREESCALE SEMICONDUCTOR, INC. LAW DEPARTMENT 7700 WEST PARMER LANE MD:TX32/PL02 AUSTIN, TX 78729			NGO, HUNG V	
			ART UNIT	PAPER NUMBER
			2831	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
P.O. Box 1450  
ALEXANDRIA, VA 22313-1450  
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Paper No. 18

Application Number: 09/928,737  
Filing Date: August 13, 2001  
Appellant(s): QUAN ET AL.

\_\_\_\_\_  
Patricia S. Goddard  
For Appellant

EXAMINER'S ANSWER

MAILED  
APR 20 2004  
GROUP 2800

This is in response to the appeal brief filed 08-20-2003.

(1) ***Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

(2) ***Related Appeals and Interferences***

Art Unit: 2831

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

The rejection of claims 17-21 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

5, 612,513

Tuttle et al

03-1997

**(10) Grounds of Rejection**

Art Unit: 2831

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tuttle et al (US 5,612,513).

Tuttle et al disclose a packaged semiconductor device comprising: providing an interconnect substrate (44) having a plurality of substantially identical package sites arranged in an array, the plurality of sites being separated by a singulation space (Fig 3); mounting and interconnecting a semiconductor device (die 50)(col. 12, line 39-40) within each site; and overmolding a single and continuous encapsulant (60) over each semiconductor device, the plurality of sites, and the singulation space (Fig 4)(re claim 17).

Re claim 18, wherein overmolding produces a top surface of the encapsulant which has a surface deviation of less than 0.13 millimeters across a length of the encapsulant (Fig 4).

Re claim 19, see col. 4, lines 1-5.

Art Unit: 2831

Re claim 20, further comprising the step of singulating the plurality of package sites after overmolding (col 6, lines 45-50).

Re claim 21, wherein singulating through the single and continuous encapsulant and the substrate along the singulation space comprises cutting which is equivalent to sawing through the single and continuous encapsulant and the interconnect substrate along the singulation space (col 6, lines 45-50).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle et al

The teaching of Tuttle et al as discussed above does not disclose the step of handling each packaged semiconductor device with automated pick and place equipment.

It is well known in the electrical art to use automated equipment for handling semiconductor device and also, automated equipment was discussed in appellant's

Art Unit: 2831

background of invention (page 1, line 30). It would have been obvious to one having ordinary skill in the art at the time the invention was made use automated equipment with electronic circuit device of Tuttle for handling the device and for simplifying assembly process.

**(11) Response to Argument**

Appellant arguments filed 08-20-30 have been fully considered but they are not persuasive.

Appellant argues (1) that Tuttle fails to disclose at least the recited step of overmolding a single and continuous encapsulant. An overmolding process is a process in which a mold on one side of a substrate to define the final encapsulant shape and profile, (2) that the dam bar is not equivalent to an overmolding process, and appellants' specification makes reference to use of a dam bar in one embodiment but says that overmolding could instead be an alternative embodiment, (3) that Tuttle fails to disclose or suggest any specific dimension or dimensional relationship regarding the top surface of the encapsulant 60 other than that it has a substantially flat top surface, (4) that Tuttle does not disclose 4x4 array, (5) that the examiner failed to show

Art Unit: 2831

sawing through a molded encapsulation material for singulation purpose, (6) that it would not be obvious to use automated equipment for the device of Tuttle because encapsulation process of these type of devices generally produces an insufficiently planar pick-up surface unless made of a particular size or using a mold or frame to define the planar surface.

With respect to (1), Tuttle et al disclose step of overmolding single and continuous encapsulant (Fig 4). In an overmolding process an encapsulating material or molding compound forms a package body only on one side of the supporting substrate (see col. 3, lines 30-34 of U.S. Pat. 5,280,193). Tuttle et al disclose an encapsulant 60 forming a package body only on one side of the support substrate 44 (as best shown in Fig 4) and this meets the limitation of overmolding.

With respect to (2), Appellants' specification (page 6, lines 6-9) recites "dam-bar 18 could be a premanufactured frame applied to area 12 and overmolding or other techniques could be used for the encapsulating", (application Fig 2). Tuttle et al disclose a dam bar 54 which is equivalent to a mold or a frame on one side of the substrate 44 to define the final encapsulant shape and profile (Fig 4).

With respect to (3), Tuttle et al recite "preferably, sufficient encapsulant 60 is utilized to give each enclosed circuit 42 a substantially flat top surface" (col. 6, lines 56-57). A substantially flat top surface has about zero surface deviation. Therefore Tuttle meets the limitation of claim 18.

Art Unit: 2831

With respect to (4) Tuttle shows a 3x4 array in Fig. 1 and Tuttle recites "Circuit array 10 is comprised of twelve individual circuits 12. However, a particular array can have a fewer or greater number of circuits 12" (col. 4, lines 1-5) and this meets the limitation of a 4x4 array.

With respect to (5), cutting is equivalent to sawing and Tuttle discloses individual circuits can be singulated by cutting (col. 6, lines 45-50).

With respect to (6), the planar surface of encapsulant 60 of Tuttle is substantially flat (see Fig 4) and Tuttle recites "sufficient encapsulant 60 is utilized to give each enclosed circuit 42 a substantially flat top surface" (col. 6, lines 56-57). Therefore it is obvious to use automated equipment to pick and place devices of Tuttle for simplifying assembly process.

For the above reasons, it is believed that the rejections should be sustained.



Art Unit: 2831

Respectfully submitted,

*Hung V Ngo*

Hung V. Ngo  
April 5, 2004

Conferees  
Dean Reichard  
Olik Chaudhuri

*DR*  
*OC*

**HUNG V. NGO**  
**PRIMARY EXAMINER**

MOTOROLA INC  
AUSTIN INTELLECTUAL PROPERTY  
LAW SECTION  
7700 WEST PARMER LANE MD: TX32/PL02  
AUSTIN, TX 78729